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ABSTRACT

Excerpts from a transcript of computer "conversations" provide the basis for a study of how people manage ongoing interaction, given the constraints of computer-mediated discourse, and whether any unusual conventions are used in doing so. The discourse was analyzed using address, topical references, and adjacency pairs to link the messages. Several factors complicate interaction by computer: the lag between real-time message production and the eventual display of a message on the screen; the absence of behaviors indicating utterance and turn boundaries, turn relevance places, or address; and the elimination of intonation, stress, gaze and pauses as management devices. Participants adapted by typing out "vocalizations" and punctuation marks such as ellipses, using imaginary physical interaction to replace face-to-face contact, and addressing each other by name more frequently than would be necessary in normal conversation. Despite the apparent disorder generated by the linear display of messages from several simultaneous conversations, participants successfully pursued multiple threads of discourse. Further research is necessary to determine to what degree the features described here are idiosyncratic to management of interaction in this particular message system. (One page of references, one appendix, and two figures are attached.) (MHC)

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A CONVERSATIONAL ANALYSIS OF COMPUTER-MEDIATED DISCOURSE

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A CONVERSATIONAL ANALYSIS OF COMPUTER-MEDIATED DISCOURSE

Abstract

In this paper a conversational analysis of computer-mediated discourse in a multi-user interactive computer message network is undertaken. The analysis utilizes adjacency pair, topical, and address linkages to examine the influence of channel constraints on the management of interaction by network participants. Examination of excerpts from a transcript of one half-hour of computer-mediated discourse reveals participants successfully pursue multiple threads of discourse despite the apparent disorder generated by linear display of messages. The discourse threads include sequences of dramatized physical interaction; it is suggested that depicted actions can assume the force of adjacency pair parts.

The development of new channels of communication provides an opportunity to examine the influences of channel constraints on interaction. Gibbon (1985, p. 396) notes: "In face to face conversation the role of the channel is unmarked. Only when noise or unaccustomed technical aids are involved. . . does its significance become clear." Gibbon argues that channel is a significant factor in interaction because channels have both natural (physical and perceptual) and conventional (social and institutional) dimensions. In this paper an ethnomethodological approach of conversational analysis will be used to interpret the ongoing management of discourse in an interactive computer message network. Computer-mediated discourse utilizes a channel with natural dimensions that impose constraints not found in face-to-face verbal interaction. Two general questions motivate this conversational analysis: 1) given the channel constraints, how do participants in computer-mediated discourse manage their interaction and 2) are there unusual conventional dimensions in computer-mediated discourse? These two questions will be addressed through description of excerpts from approximately one half-hour of interaction (357 messages) in a public interactive computer message network.

The natural dimensions of the computer network channel impose a number of physical constraints. The communication is terminal-to-terminal; messages are typed rather than spoken, and are displayed on video screens or printers. In the computer network that served as the source of the data examined here, messages are displayed on the participant's video monitor or printer in the order they are received by the central

exchange. The rate of message display is constrained by the rate of signal transmission and the capabilities of the VDU monitor or printer, but even at the relatively slow signal transmission rate of 300 baud the rate of message display is quite rapid. On video displays the messages scroll out of sight; use of a printer is required if the user wishes quick access to previous messages. The system has the advantage of self-transcribing if a printer is used. Not all messages are necessarily visible in a given transcript; in this network users have the option of sending private messages that are displayed only to a specified recipient. The example below is a typical portion of a display (all examples used herein reproduce characteristics of capitalization and typographical errors of the original transcript):

(SWEETSTUFF) GOOD EVENING ALL

(STROKER) hi desert fox

(NAMREGIT) hi ya stuff

(KURT) HIYA SWEETSTUFF

(*DESERT FOX) HOWDY STROKER

Such computer-mediated discourse is real-time interaction in that the participants are temporally present to each other by simultaneous use of the network. However, the real-time presence is mediated by the time lapse involved in typing a message and the delay caused by first-in, first-out processing at the central exchange. The channel is linear: messages that are for all practical purposes simultaneous are displayed sequentially with no overlap, ordered by the micro-second time differences in their arrival at the central exchange. This expands the time slot

occupied by an interchange, creating a lag between the real-time message production and the eventual display of the messages. A direct response to a message will usually be separated from that message by other messages sent while the user typed the reply and entered it. This effect will lessen or increase in proportion to the number of active users. In most cases the delay is great enough that message and response sequences such as adjacency pair parts will not be physically adjacent. An adjacency pair is a sequential structure of turns such that the first pair part constrains what is preferred in a later turn (Sacks & Schegloff, 1973). In the example given earlier two sets of adjacency pairs can be identified:

(SWEETSTUFF) GOOD EVENING ALL	(1st pair part, A)
(STROKER) hi desert fox	(1st pair part, B)
(NAMREGIT) hi ya stuff	(2nd pair part, A)
(KORT) hi ya sweetstuff	(2nd pair part, A)
(*DESERT FOX) HOWDY STROKER	(2nd pair part, B)

An immediate problem in interpretation is evident in this example. There are two first pair parts and three second pair parts, not equal numbers of each as might be expected. The mismatch results because there are two second pair parts to the first pair part A. This pairing is difficult to deny because both second pair parts are addressed to the author of the first pair part, and the two second pair parts are virtually identical. However, there seems to be no compelling reason to deny the possibility of such redundant pair parts. A conventional example occurs when a professor enters a classroom and offers a "good

morning, class" to which the students respond with joint "good mornings" or "hellos."

Note that in the example there are two ongoing adjacency pairs. The mechanism identified by conversation analysts for the overlap of adjacency pairs is the insertion sequence, i.e., an adjacency pair within an adjacency pair. In the example at hand the overlap is the result of channel constraints, rather than an insertion sequence. One pair is not embedded within the other; rather, they are interspersive. They are sequential yet belong to different sequences.

Management of computer-mediated discourse is complicated by the absence of behaviors which serve to indicate utterance and turn boundaries, turn relevance places, and address. The channel eliminates use of intonation, stress, gaze, and pauses as management devices for smooth speaker changes (Sanders, 1983). The absence of these devices is mitigated by the channel-enforced linearity of message display. The design of the network insures smooth "speaker" changes at the level of message display. The turn-taking system described by Sacks, Schegloff, and Jefferson (1974) still operates, but in modified form because overlaps and interruptions cannot occur. The concept of the transition relevance place (TRP) becomes irrelevant insofar as any user can enter a message at any point without interfering with the messages of other users. In face-to-face interaction pauses are often TRPs. To preserve a turn the speaker may fill the pause with a vocalization such as "um" or "ah" to indicate that the turn is not complete. In computer-mediated discourse the sender of a message is not confronted with the possibility of

interruption or the loss of a turn, but both filled and unfilled pauses are graphically represented in messages:

- A. (STROKER) psydoc. . . look at ti this way. . .
nevermind. . . hahahaha
- B. (*ZAFTIG LADY*) stoker. . . ok. . . but. . .uh. . .
there is one slight problem. . .um. . . sure no one
will object (smile)

In these examples the periods and "vocalizations" may serve as stylistic devices to indicate hesitancy. This would constitute an effort to substitute for non-verbal message components denied by the channel. An alternative explanation is that pauses are used to separate utterances within messages in the same fashion as comma, dashes, and colons. This explanation is supported by the fact that in the transcript examined such devices are most often used within a message rather than as terminal punctuation. Another possibility is that graphic pauses are used as attention-motivators. Users are not constrained from entering messages at any time; therefore the user has the option of disregarding the message display in order to enter a message. Pauses within a message may inform the user that the message is incomplete, thereby motivating the user to attend to the display until that message is completed.

Some problems of structural analysis of discourse are resolved by the design of the network. For example, turn construction is easily identified: a message entered by a sender constitutes a turn. This is any entry followed by a RETURN, because the sender's nickname and entry will be displayed. In the example below a user has inadvertently entered a superfluous

character in front of a private message command (/msg). The central exchange fails to recognize the command and it is displayed as a public message:

(*DAVE) d/msg judy

(*DAVE) Oooh, flubbed that one. . . I mean't to say an even better person.

The user self-repairs the error even though the message consists only of a computer command, suggesting the user saw the error as a turn.

Turns are arranged and displayed sequentially by the central exchange. This eliminates problems involved in structuring simultaneous talk, but at the same time another problem is created. A line may contain a large number of active users, not all of whom are involved in the same conversation. A transcript of computer-mediated discourse may be analogous to a transcript of utterances from a cocktail party's flow of simultaneous conversations, arranged in order of occurrence and including remarks of partygoers drifting from conversation to conversation. In this sense the interaction of several dozen participants in a computer message network does not constitute a single conversation that can be examined for its structure. Rather, there may be a number of ongoing conversations which must be sorted out before the structure of each can be examined.

The sorting out is accomplished by examining messages within the transcript for coherence, the "relevance of successive utterances both to those that precede them and to global concerns of the discourse as a whole" (McLaughlin, 1984, p. 270). For the purpose of unraveling what Black, Levin, Mehan,

& Quinn (1983) called the threads of discourse the messages in the transcript were analyzed for local relevance and global relevance. Local relevance was defined in a number of ways. First and foremost is the use of address terms within a message. Sacks, Schegloff, & Jefferson (1974) see address as a basic component of selecting a next speaker, especially when combined with the first pair part of an adjacency pair. If a turn fulfills the preferred response parameters of an earlier turn it may be linked to that turn as a second pair part. Examination of such links between utterances is one way we can differentiate discourse from a random collection of utterances (Schiffren, 1985). Read sequentially without regard to the structure provided by address and adjacency pair links the example below could appear random (the numbers indicate the message sequence in the original transcript):

26 (*DAVE) Is there any room for a newcomer here?
 27 (*TAR) like I said, Kris. . .never thought I *had* it. . .
 28 (*DESERT FOX) Howdy, Stroker!
 29 (PSYDOC) hello kort
 30 (*ZAFtig LADY) rekortsikins!
 31 (KRISTEN) Bye, Wild!!!!
 32 (STROKER) lady. . . like who. . me????
 33 (KORT) HI PSY
 34 (JUDY) HI DAVE. . . SURE. . . WELCOME

If messages from this sample are paired according to address and adjacency pairs we can motivate the following sets of exchanges:

A. (*DAVE) Is there any room for a newcomer here?

(JUDY) HI DAVE. . . SURE. . . WELCME

In sequence A a question/answer pair is linked by Judy's use of direct address to identify her message as a second pair part to Dave's first pair part. In face-to-face or dyadic communication the direct address in the second pair part would be optional, because address could be indicated by gaze, gesture, or the absence of other potential addressees. In this case it may not be mandatory but is at least constrained as preferable because the two messages are separated by seven other messages not related to this sequence.

B. (PSYDOC) hello Kort

(KORT) HI PSY

In sequence B we find a simple greeting/greeting pair. The possible ambiguity of a greeting offered in a multi-party context is removed by direct reference. Address is not as clear in sequence C:

C. (*ZAFTIG LADY) rekortsikins!

. (STROKER) lady. . . like who. . me????

This pair is unusual because the two pair parts are almost physically adjacent in the transcript, suggesting a slower flow of messages at that point. Though the first pair part is problematical, it appears to be the initiation of a summons/answer pair. The user summoned is not clear; "ikins" may be a diminutive suffix but there is no user in the transcript with the nickname rekorts. Stroker answers the summons, perhaps because rekorts spelled backwards is stroker, and indicates his confusion about the subject of the summons. Incidentally, it is indicated later in the transcript that his response was in error.

Kort was the subject of the summons. The "re" prefix indicates that the summons is a repetition of an earlier summons.

Three messages do not appear to cohere to the portion of the transcript in the example. These are:

- D. (*'TAR) like I said, Kris. . . never thought I *had* it. . .
- E. (PSYDOC) Howdy, Stroker!
- F. (KRISTEN) Bye, WILD!!!!

In D the linking device "like I said" and the use of direct address to Kris suggest that the message is a sequential response to an earlier message from Kris. In a similar fashion E and F do not cohere to the given messages. As greeting and closing pair parts, respectively, they could be either first pair parts or second pair parts. At least three possibilities are available for each. First, they may serve as second pair parts in adjacency pairs initiated earlier in the interaction. Second, they may serve as first pair parts in adjacency pairs completed later in the transcript. Third, they may serve as first pair parts which receive no second pair parts (a dispreferred response). Determination of which of these possibilities is the case is complicated by the possibility that the other pair parts may have been provided in private messages not visible in the transcript.

Insert Figure One about here

It is unlikely that all computer-mediated discourse could be sorted out through local characteristics of address and adjacency pairs (though many of the sequences can be; 235 of the

357 messages in the transcript examined contain address terms).
 Topical and propositional linkages may also aid in identifying
 sequential coherence:

329 (KORT) --CANNOT PICTURE STROKER BEING HOCKEY FAN

330 (STROKER) hahahahahhahahaha...no comment..cant type what i
 was thinking

331 (*S. FETCHER*) MS. Doc --- Like I said, I'll see what I can
 do ...gen hectic like vrazy here...

332 (*DAVE) Oooh, flubbed that one... I mean't to say an even
 better person

333 (MS. DOC) --CAN picture stroker being hockey fan!

334 (MS. DOC) an such a cutie too!

335 (STROKER) Kort...thats only cause you always saw me with my
 clothes on

336 (*MAXREP) takk skull du ha, everyone. got to go.

337 (KORT) --CAN PICTURE DOXIE BEING A STROKER FAN

In message 329 Kort introduces a topic area in response to Stroker's recitation of a hockey score in an earlier message (316). The topic area reappears in message 333: the link is semantically established in reference to Stroker and hockey fan. Message 334 can be interpreted as part of this sequence as well. The "too" indicates a link to another message, and "cutie" could be the topic Stroker. An alternative is that line 334 is a compliment offered in response to Fetcher's promise to Ms. Doc in message 331. Message 335 coheres to the sequence through an address link and its topical relevance as a rebuttal to message 329. Message 337 also includes a semantic link to the topic. The problematic nature of topic is evident in this example. No

single topic of hockey fans, Stroker, or Doxie coheres as the subject of each message, but each of the messages appears to link to propositional content of a previous message, with the exceptions of message 332 (discussed earlier) and message 336 (a closing). A useful analogy may be that a topic is a thread of discourse woven of several strands.

Using the techniques of local (adjacency pair and address) and global (topical) relevance a number of cohering sequences have been isolated from the transcript. Three of these sequences are examined below to demonstrate that participants in computer-mediated discourse effectively manage their interaction despite channel constraints. The first sequence was initiated in a portion of the transcript discussed earlier:

26 (*DAVE) Is there any room for a newcomer here?

34 (JUDY) HI DAVE. . . SURE. . . WELCOME

35 (TURBOZX) HIYA DAVE

36 (*ZAFTIG LADY) hiya dave. . . sure and welcome

37 (DESERT FOX) Come on in, Dave

42 (PSYDOC) Dave, -yes, the bar's to the left and the men's room is downstairs

Note that in this sequence we again find multiple responses to a first pair part, with each second pair part addressed to the author of the first pair part. The sequence also displays the message display lag discussed earlier. Seven messages are processed by the central exchange between the display of the first and second messages of this sequence. Four of the second pair parts are adjacent to each other. This suggests that the four were sent to the central exchange at approximately the same

time. The seven messages embedded between messages 26 and 34 indicate the time lapse involved in typing and entering a reply to message 26. The four-message lapse between lines 37 and 42 is indicative of the extra time involved in typing a longer message.

The next sequence introduces an unusual feature of computer-mediated discourse:

```
150 (TURBOZX)  ZAFTIG-- IS YOUR /MSG key STUCK?
153 (*ZAFTIG LADY80  <<<<<---on model 100...i miss alot
160 (*DESERT FOX)  <---HANDING ZAFTIG A PRINTER
174 (*DESERT FOX)  <---HANDING ZAFTIG A PRINTER
184 (*ZAFTIG LADY*)  desert...actually...a bigger display would
    be nice
194 (*DESERT FOX)  <---TOSSING MODEL 111 OUT WINDOW TO ZAFTIG
207 (*ZAFTIG LADY*)  #$$@#$$%CRASH*&*$%$#@
212 (*ZAFTIG LADY*)  omigod...deseret...i misse dit
```

The imaginary physical interaction in this sequence is structured in a fashion analogous to more conventional forms of adjacency pairs. The action undertaken in message 160 includes another user, and therefore can be considered a first pair part. It constrains a later message of the addressed individual by inviting completion of the action. That Desert Fox repeats the message reinforces the interpretation that a response is expected. The completion of the pair occurs in message 184, when Zaftig Lady declines to accept the imaginary printer. Desert Fox responds with a higher bid in message 194, and Zaftig Lady completes the sequential action with a sound cue indicating her involvement in the depicted action.

A later sequence also demonstrates the adjacency pair force of dramatized physical interaction:

235 (DUNCAN) (hitting fingers so they will work right)

241 (WHO CARES) <passing Duncan a hammer>

248 (DUNCAN))))))WHOMP((((

255 (*DESERT FOX) <---HANDING FINGER CAST TO DUNCAN

260 (DUNCAN) there! hope that's better!

Message 235, according to the definition of "action pair" developed above, does not constitute a first pair part because the action described does not involve another person. In contrast, message 241 does initiate an adjacency pair because Duncan is involved in the act of passing a hammer. Duncan provides the second pair part by "using" the hammer in message 248. Similarly, Desert Fox offers a first pair part in message 255 and Duncan completes the action in message 260.

The use of imaginary physical interaction may be an adaptation to the absence of face-to-face contact inherent in the channel. It is a convention that allows users to engage, in a mimetic fashion, in the kind of physical interaction possible when interactants are physically present to each other. A structural analysis indicates how such joint actions are accomplished; however, it remains to be determined why they occur.

Isolating message sequences from the linear flow of the message display demonstrates that the superficially chaotic flow of messages does cohere as interwoven independent sequences. This isolation is, of course post hoc; the user of the network is confronted with a display of messages that has not been so

conveniently organized. The sequences are interwoven with each other, as shown in a map of threads of discourse over a set of 24 messages (see Appendix). In the discourse mapped in Figure 2 there are 12 participants, identified alphabetically in the order of their initial messages. Cohering sequences are arranged by column; seven threads of discourse that cohere topically or structurally are identified.

Insert Figure Two about here

The first 9 messages of the map involve the sequences analyzed earlier, beginning with "(*DAVE) Is there any room for a newcomer here?" As the interaction progresses it appears that threads 11 and 111 are terminated or continue in private messages. Threads I, IV, and V continue through most of this portion of the transcript. Thread VII appears to be an independent adjacency pair, but it can also be interpreted as a spin-off of thread I. Messages 26 and 42 of thread I are an initiation and response between the interactants A and D; messages 48 and 49 continue the conversation as first topic slot and topic uptake. Two messages do not appear to cohere. Message 38 is a closing that receives no public response. It is possible that in this channel a closing constrains no response. First, users may not respond acting on the assumption that the participant has logged off the system after the closing message. However, in an earlier portion of the transcript a closing sequence continues over 36 messages, even though the departing user does not enter a message indicating continued presence in the network until 12 intervening messages have been displayed.

This investment in a closing sequence may result from a lack of co-present threads, while in the discourse mapped in Figure 2 the competition from threads I, IV, and V could reduce interest in responding to the closing. Secondly, not all messages are necessarily visible in the transcript. The possibility that private messages link to the isolated messages discussed should not be overlooked. The design of this network provides users the choice of sending a message for display only to a specific recipient rather than to all users. On the other hand, the assumption that all problematical pairings are resolved in such private messages is too easy an answer to accept unless other possibilities have first been exhausted.

Topic shift on an individual level appears often to be a matter of moving from thread to thread as well as initiating new threads. For example, D moves from thread IV to I, even though other users continue to pursue thread IV. G and H alternate between threads IV and V. Black, Levin, Mehan, and Quinn (1983) examined discourse threads in non-real-time computer mail and real-time dyadic computer-mediated discourse. Multiple threads were common in computer mail and rare in real-time interaction. It was concluded that the constraints of real-time discourse taxed cognitive processing abilities to the degree that multiple topics could not be pursued simultaneously. It appears that the interaction examined here falls between the two extremes examined by Black et al. Threads of discourse within the network do not overlap within messages, as may threads in computer mail, but multiple threads are present.

The frequent use of adjacency pairs and address terms may serve to reduce cognitive processing demands by constraining a large number of message slots. In effect, the user may not be simultaneously attending to multiple threads, but rather may be switching from one to another in response to attention-motivating messages such as adjacency pair parts and direct addresses. This would concur with Norman's (1969) finding that when there is a possibility of attending to parallel discourse events an individual will still participate in only one at a time. In the mapped interaction no user appeared to be switching back and forth between more than two ongoing threads. Given the methodology used here, and without examining a larger sample, it is impossible to determine if this is a limit imposed by cognitive processing constraints or simply idiosyncratic to the sample.

This essay, as an exploratory conversational analysis of computer-mediated discourse, has sought to provide a fine-grained description of several structural aspects of such interaction that appear to be influenced by channel constraints. In the message transcript examined for this analysis, discourse is managed in part through frequent use of adjacency pairs and address terms. Participants may also follow the threads of discourse through attention to topical coherence. The network participants make use of an unusual feature of dramatized physical interaction as part of their conversations. Further research is needed to determine to what degree the features described here are idiosyncratic to management of interaction in this message system or characteristic of other networks as well.

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Appendix

Transcript of a Sample of Computer-mediated Discourse

26 (*DAVE) Is there any room for a newcomer here?

27 (*'TAR) like I said, kris...never thought I *had* it...

28 (*DESERT FOX) Howdy, Stroker!

29 (PSYDOC) hello kort

30 (*ZAF11G LADY*) rekortsikins!

31 (KRISTEN) Bye, WILD!!!!

32 (STROKER) lady...like who..me????

33 (KORT) HI PSY

34 (JUDY) HI DAVE...SURE..WELCME

35 (TURBOZX) HIYA DAVE

36 (*ZAF11G LADY*) hiya dave...sure and welcome

37 (*DESERT FOX) Come on in, Dave

38 (*.* AT YALECLUB) bye all you good folks -- see ya soon!

39 (STROKER) hiya kort..huggs and a lingering caress

40 (KORT) RE HUGGERS ZAFFY

41 (KRISTEN) KORT!!!!!!!!!!!!!!!!!!!!

42 (PSYDOC) Dave -yes, the bar's to the left and the men's room
is downstairs

43 (KORT) HUGGS KRIS

44 (*NAMREGIT) hi yall

45 (*ZAF11G LADY*) stroker...not thinking of you zactly...giffle
...but thats another one to think about

46 (KORT) HANDSHAKES STROKER

47 (*DESERT FOX) <---Heading for bar !!!

48 (*DAVE) Psydoc, I seem to remember you from ClS...?

49 (PSYDOC) Dave - could be.

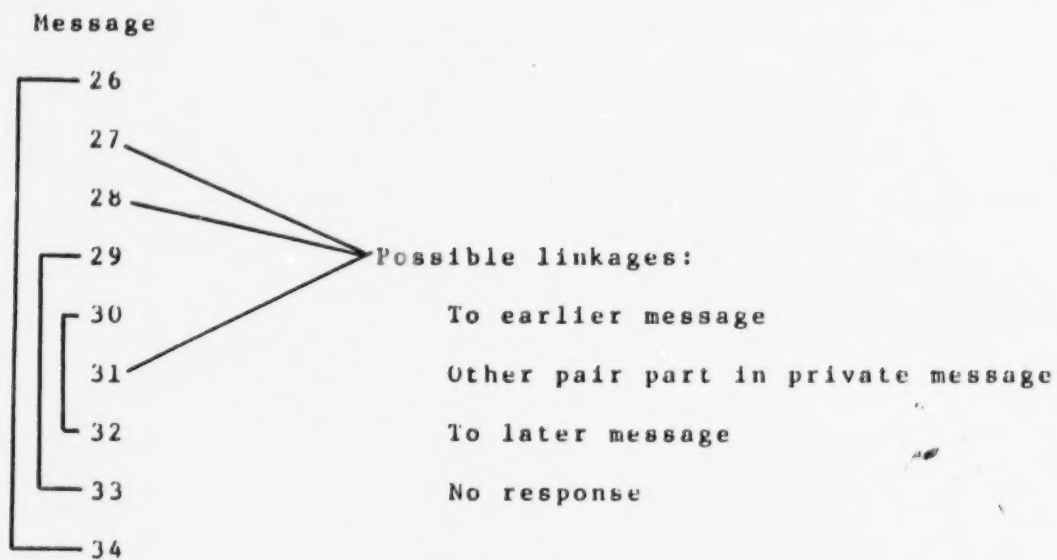


Figure 1. Message sequential linkages.

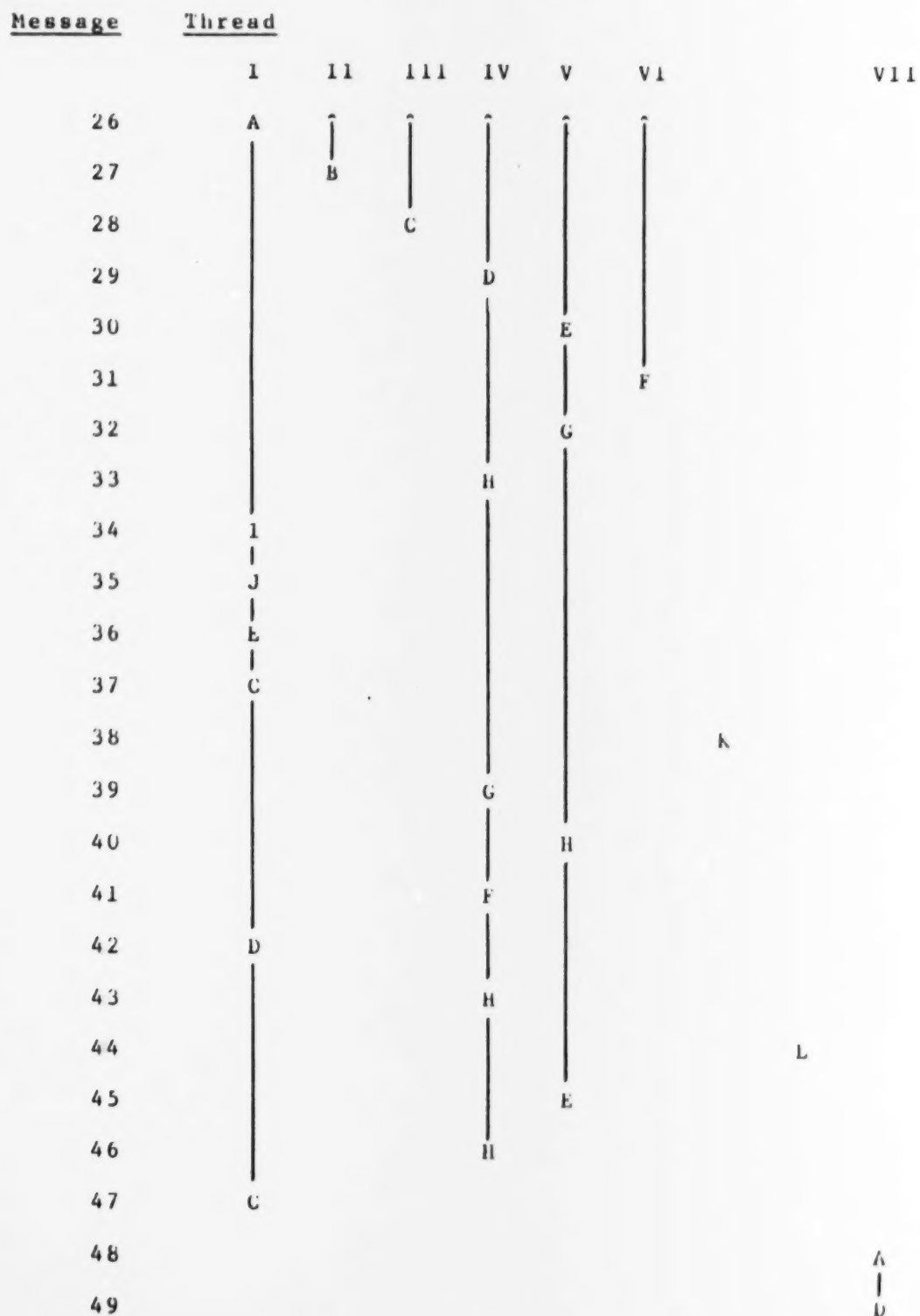


Figure 2. Map of computer-mediated discourse threads.